



Amending Moore's Law for Embedded Applications Panel Discussion

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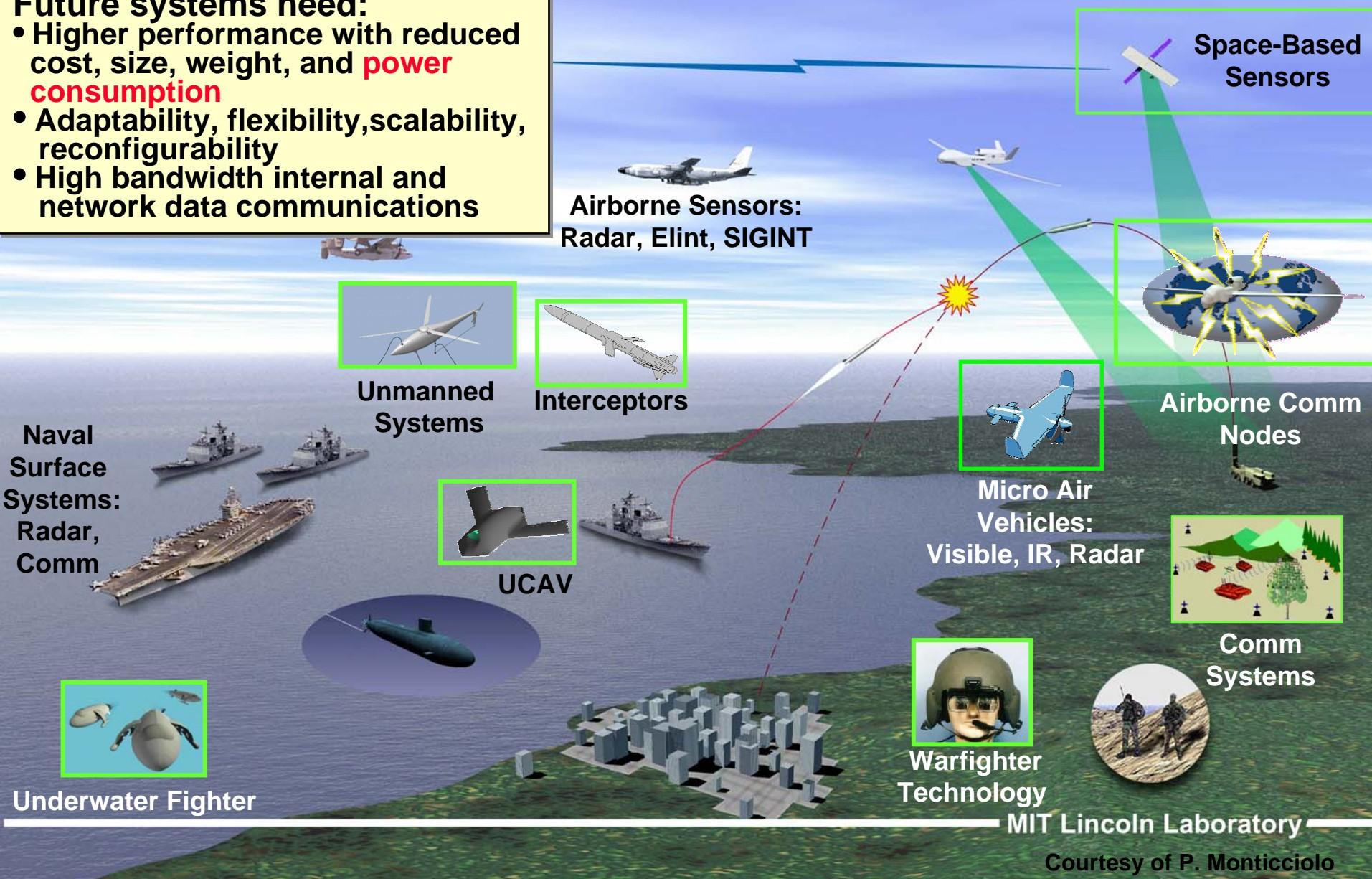
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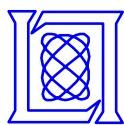


DoD Embedded Processing Applications

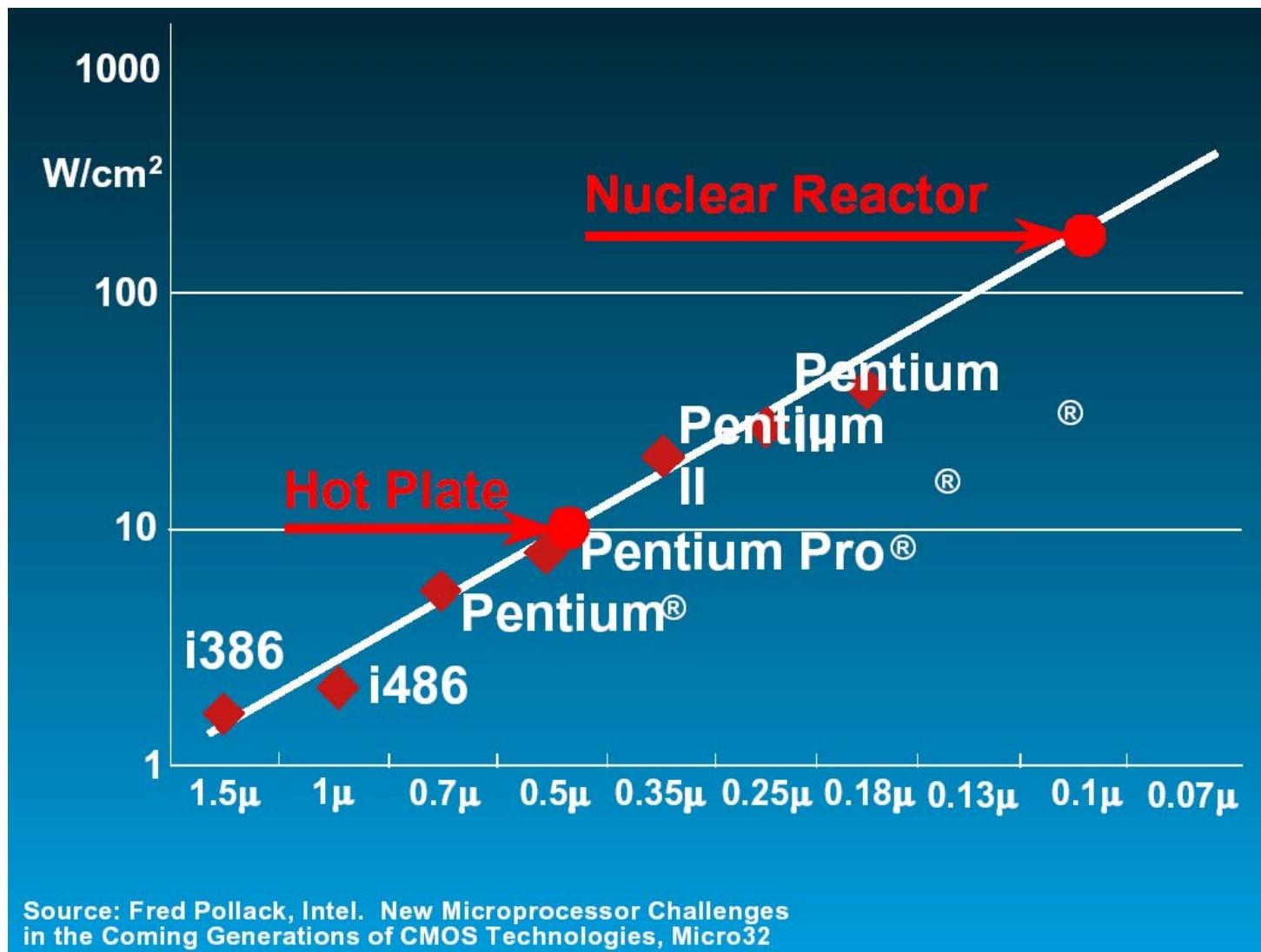
Future systems need:

- Higher performance with reduced cost, size, weight, and **power consumption**
- Adaptability, flexibility, scalability, reconfigurability
- High bandwidth internal and network data communications



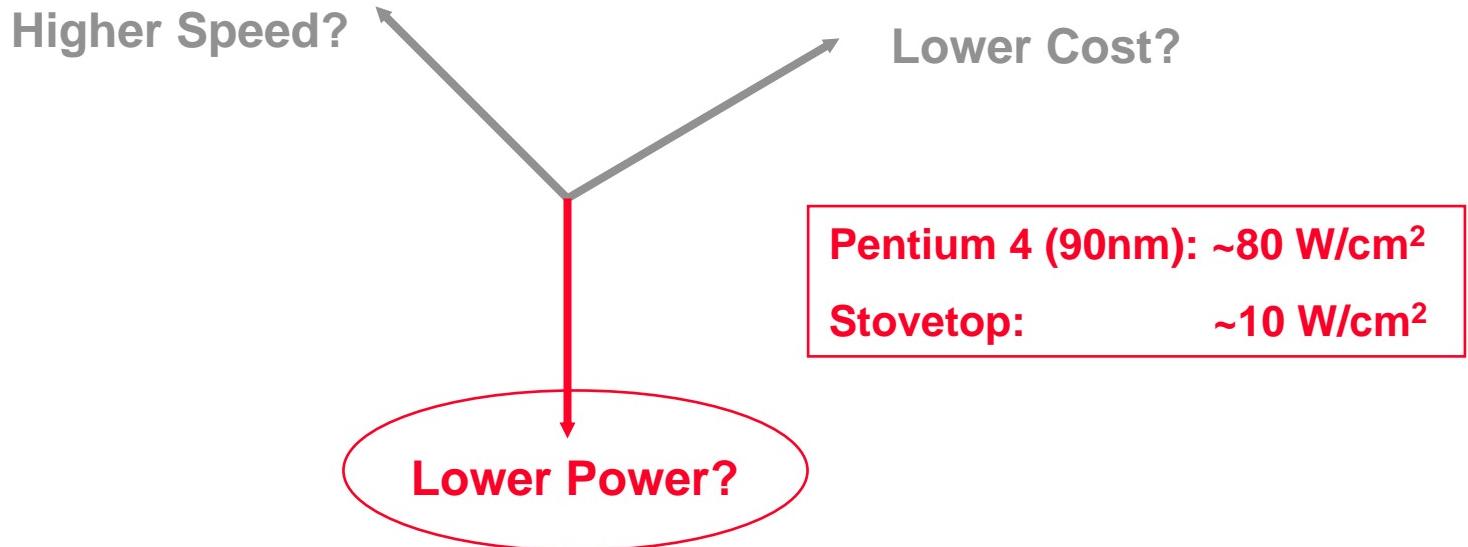


Power Density: The Fundamental Problem





Prognosis For Moore's Law Benefits



Past

Supply voltage (V) scales as 1/s
Capacitance (C) scales as 1/s
Energy per op scales as $CV^2 \propto 1/s^3$

⇒ Voltage scaling from 5V to 1V accounts for 25X reduction in power, just by itself

Future Issues

Only 2x voltage scaling planned (1V now to ~0.5V in 2016)
⇒ Scaling energy per op is critical to long endurance battery powered systems and to supercomputers (getting power in and heat out)